Lingcod Tagging Study in the Strait of Georgia, 1983-84

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LINGCOD TAGGING STUDY IN THE STRAIT OF GEORGIA, 1983-84

by

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ABSTRACT

Cass, A. J., G. A. McFarlane, M. S. Smith, I. Barber, and K. Rutherford. 1986. Lingcod tagging study in the Strait of Georgia, 1983-84. Can. MS Rep. Fish. Aquat. Sci. 1875: 49 p.

This report describes the second year of a three year lingcod tagging study in the Strait of Georgia. The purpose of the study is to estimate survival, abundance, and exploitation rates and to examine stock distribution.

Tagging continued in 1983-84 in the Campbell River, Stuart Island, and Pender Harbour areas during the winter fishing closure. All lingcod were tagged using a yellow floy-FD68 anchor tag. Eighteen percent were double-tagged to estimate tag loss.

A total of 2526 lingcod were tagged. Catch rates in the Campbell River area declined to 68% of the 1982-83 level. Catch rates in the Stuart Island and Pender Harbour areas were similar to 1982-83 levels.

As observed in the 1982-83 tagging period, there were distinct differences in the sex and size composition with changes in depth. The catch at depths 40 m was comprised of 72% males. At depths 40 m females dominated the catch, accounting for 71% of the catch. Larger males and females were found at deeper depths. There were significant differences in the size distributions between 1982-83 and 1983-84 due to declines in mean lengths of males and females in the Campbell River and Pender Harbour area. The decline in catch rates between 1982-83 and 1983-84 is attributed to the decline in abundance of lingcod in the areas fished.

A total of 218 tagged lingcod were recaptured and re-released during the 1983-84 tagging period. Of the recaptures made while tagging, 40% were tagged during the 1982-83 period. A total of 105 tags (4%) from the 1983-84 tagging period and 30 tags (1%) from the 1982-83 period were reported by fishermen during the 1984 fishing season.

Sports and commercial fisheries are selective for different sizes of lingcod. The commercial fishery targets to a greater extent on larger fish when they are available. The sports fishery, in general, exploits smaller fish.

Tag losses from double-tagged lingcod recovered during the second year of liberty (1982-83 releases) were 1 (8%) at the primary tag site and 5 (42%) at the secondary site. Tag losses during the first year of liberty (1983-84 releases) were 2 (5%) at the primary tag site and 6 (16%) at the secondary tag site.

Of the 99 recoveries reported by specific locations from releases in 1983-84, 95% were recovered within 5 km of the area of release. Of 18 recoveries in the 1984 fishery from releases in 1982-83, 15 (83%) were caught within 5 km of the area of release.

Preliminary estimates of exploitation rates ranged from 0.14-0.21 in the Campbell River and Stuart Island areas in 1983. In 1984, exploitation rates declined to 0.03-0.05 and 0.05-0.07 in these two areas, respectively. Exploitation rates in the Pender Harbour area were similar in both 1983 and 1984 and ranged from 0.10-0.14 and 0.09-0.13, respectively.

RÉSUMÉ

Cass, A. J., G. A. McFarlane, M. S. Smith, I. Barber, and K. Rutherford. 1986. Lingcod tagging study in the Strait of Georgia, 1983-84. Can. MS Rep. Fish. Aquat. Sci. 1875: 49 p.

Dans la présent rapport, on décrit la deuxième année d'une étude de la morue-lingue par étiquetage étalée sur trois ans qui a été réalisée dans le détroit de Géorgie. L'étude a pour but d'évaluer la survie, l'abondance et les taux d'exploitation et d'étudier la répartition des stocks.

L'étiquetage s'est poursuivi en 1983-1984 dans les secteurs de la rivière Campbell, de l'île Stuart et de Pender Harbour pendant la période hibernale de pêche prohibée. Toutes les morues-lingues ont été marquées à l'aide d'une étiquette jaune à ancrage Floy-FD68. On a posé deux étiquettes sur dix-huit pour cent d'entre elles pour évaluer la perte d'étiquettes.

On a marqué au total 2526 morues-lingues. Les taux de capture dans la région de la rivière Campbell ont baissé pour atteindre 68 % du niveau enregistré en 1982-1983. Les taux de capture dans les régions de l'île Stuart et de Pender Harbour ont été semblables aux niveaux enregistrés en 1982-1983.

Comme observé au cours de la période d'étiquetage de 1982-1983, il y avait des différences sensibles dans la composition par sexe et par taille selon la profondeur. Les prises à des profondeurs inférieures à 40 m étaient constituees à 72 % de mâles. À des profondeurs supérieures à 40 m, on retrouvait dans les prises un plus grand nombre de femelles, qui représentaient 71 % de celles-ci. À de plus grandes profondeurs, les femelles et les mâles avaient une plus grande dimension. Il y a eu des différences significatives dans la répartition des tailles entre les années 1982-1983 et 1983-1984 en raison d'une diminution de la longueur moyenne des mâles et des femelles se trouvant dans le secteur de la rivière Campbell et de Pender Harbour. On attribue la baisse des taux de capture entre les années 1982-1983 et 1983-1984 à un moins grand nombre de morue-lingue dans les secteurs pêchés.

Au total, on a recapturé et remis à l'eau une nouvelle fois 218 morues-lingues marquées au cours de la période d'étiquetage de 1983-1984. Parmi les recaptures qui ont été faites pendant l'étiquetage, 40 % ont été marquées au cours de la période de 1982-1983. Pendant la saison de pêche de 1984, les pêcheurs ont signalé 105 étiquettes (4 %) posées pendant la période d'étiquetage de 1983-1984 et 30 étiquettes qui l'avaient été pendant la période de 1982-1983.

Les pêcheurs commerciaux et sportifs capturent des morues-lingues de tailles différentes. Dans le cas de la pêche commerciale, on cherche à

capturer une plus grande quantité de gros poissons lorsqu'ils sont disponibles, tandis que la pêche sportive se fait de façon générale sur des poissons plus petits.

Chez les morues-lingues auxquelles on avait fixé deux étiquettes et qui ont été reprises au cours de la deuxième année de liberté (poissons remis à l'eau en 1982-1983), 1 étiquette (8 %) a été perdue au site principal d'étiquetage et 5 (42 %) l'ont été au site secondaire. Au cours de la première année de liberté (poissons remis à l'eau en 1983-1984), 2 étiquettes (5 %) ont été perdues au site principal d'étiquetage et 6 (16 %) l'ont été au site secondaire.

Des 99 poissons recapturés remis à l'eau en 1983-1984 et signalés à des endroits précis, 95 % ont été repris à moins de 5 km de l'endroit de remise à l'eau. Des 18 poissons recapturés pendant la saisons de pêche de 1984 qui avaient été remis à l'eau en 1982-1983, 15 (83 %) ont été pris à moins de 5 km de l'endroit de remise à l'eau.

Les estimations préliminaires des taux d'exploitation ont varié de 0,14 à 0,21 dans les secteurs de la rivière Campbell et de l'île Stuart en 1983. En 1984, les taux d'exploitation ont baissé pour se situer respectivement entre 0,03 et 0,05 et entre 0,05 et 0,07 dans ces deux secteurs. Les taux d'exploitation dans le secteur de Pender Harbour ont été semblables en 1983 et 1984 et ont varié respectivement de 0,10 à 0,14 et de 0,09 à 0,13.

INTRODUCTION

This report describes the second year of a three year lingcod tagging study in the Strait of Georgia. The purpose of the study is to determine the impact on fishing by estimating survival, abundance and exploitation rates and to examine stock distribution in key areas of the Strait of Georgia. The methods and results of the first year are presented in Cass et al. 1984. Results presented in this report are based on releases of tagged fish during 1982-83 and 1983-84 and recoveries during the 1983 and 1984 fisheries.

METHODS

During 1983-84 lingcod tagging continued in the Campbell River, Stuart Island and Pender Harbour areas (Fig. 1). As in 1982-83, tagging was conducted during the winter fishing closure. This was done to prevent recaptures of tagged lingcod by fishermen immediately upon their release and to allow time for tagged fish to become mixed with untagged stock components.

Tagging in the Campbell River area was conducted during October 17, 1983 through February 8, 1984. Tagging in the Pender Harbour and Stuart Island areas was conducted during January 8-February 8, 1984 and during February 15-March 10, 1984, respectively. A total of 99 d were spent tagging; 60 d in the Campbell River area, 20 d in the Pender area, and 19 d in the Stuart Island area.

FISHING METHODS

Tagging was conducted from chartered commercial fishing vessels. The M/V MISS QUADRA, the M/V BREAKAWAY and the M/V FRASER BELLE were used for tagging operations in the Campbell River, Pender Harbour and Stuart Island areas, respectively. All three vessels were also used during the 1982-83 tagging period.

Lingcod were caught using hooks baited with live herring. Hook types and sizes varied among the three tagging areas. In the Campbell River area two different hooks were used; a single mustad 8/0 and a slightly smaller size Japanese hook unavailable in Canada. Mustad 1/0 and 3/0 treble hooks were used in the Pender Harbour area. Mustad 5/0 and 6/0 hooks were used in the Stuart Island area.

Fishing was conducted close to shore along rocky areas and kelp beds as well as at deeper, more exposed reefs known to be populated by lingcod. Fishing was conducted at depths ranging from 9-90 m.

TAGGING METHODS

The type of tag and the method of application used in 1983-84 was the same as in 1982-83 (Cass et al. 1984). All fish were tagged with a yellow, floy - FD68 anchor tag. Each tag was number coded for identification and contained the following message: Reward Pacific Biological Station. All lingcod were tagged just below the base of the anterior portion of the first dorsal fin (primary site). A second tag was applied posterior to the first tag (secondary site) in a proportion of randomly selected fish to estimate the rate of tag loss. In an attempt to increase the accuracy of our estimate of tag loss the proportion of lingcod that received a second tag was increased during 1983-84 to 18% compared to 10% in 1982-83.

SAMPLING METHODS

Captured lingcod were placed in a holding tank containing fresh sea water and the anaesthetic MS222 (tricaine methane sulfonate). Fresh sea water was added to the tank if respiration became excessively reduced.

Lingcod hooked in the gill or throat were not tagged. Past experience has shown that mortality of these fish is very high. In most cases, lingcod were hooked in the jaw or mouth. In these fish, the hooks were easily removed with no apparent damage.

Lingcod were measured for fork length to the nearest millimeter. Sex was determined by the presence of the external papillae at the anal vent in males. Observations on injuries and condition of each tagged fish were recorded. All tagged lingcod were held in holding tanks prior to their release in order to assess short-term mortality from tagging-related stresses.

The 4th-5th second-dorsal fin rays were removed from selected tagged lingcod for age determination. Every third fish from the Campbell River area was sampled for age. In the Pender Harbour area every fish over 55 cm was sampled for age. Tagged lingcod released in the Stuart Island area were not sampled for age.

Tagged fish caught during the tagging period were re-released after recording the tag number, date and area of recapture.

Recapture information reported by fishermen included date and area of capture, target species and fishing method. Whole tagged fish returned were measured for fork length to the nearest millimeter, sampled for sex and maturity, and sections of the 4th-9th fin rays from the second dorsal fin were removed for age determination.

ADVERTISING

Letters and posters describing the tagging study were redistributed in April 1984. They were originally distributed in 1983 to marinas, retail outlets, resorts, processing plants, and fisheries offices throughout coastal areas of the Strait of Georgia.

RESULTS AND DISCUSSION

A total of 2526 lingcod were tagged during 1983-84; 1682 (67%) in the Campbell River area, 550 (22%) in the Pender Harbour area and 294 (11%) in the Stuart Island area. Numbers of tag releases by area and date are summarized in Table 1. Tag release information including the tag numbers used at each release site is presented in Appendix 1.

Catch rates in the Campbell River area declined to 68% of the 1982-83 level or from an average of 41 to 28 lingcod per day. Catch rates in the Stuart Island and Pender Harbour areas during 1983-84 were similar to levels in 1982-83. During 1983-84 catch rates in the Pender Harbour area averaged 27 lingcod per day compared to 26 lingcod per day in 1982-83. In the Stuart Island area catch rates in 1983-84 averaged 18 per day compared to 21 per day in 1982-83.

SEX AND SIZE COMPOSITION

Females accounted for 55% of all tag releases; 56% in the Campbell River area, 47% in the Pender Harbour area and 64% in the Stuart Island area. For all areas combined, fork lengths of females ranged from 30-120 cm and males from 30-91 cm. Length frequencies of lingcod by tagging location for each of the tagging areas are listed in Appendix 2.

As observed during 1982-83, there were distinct differences in the sex and size composition with changes in depth (Figs. 2-4). The catch of lingcod in the Campbell River area at depths <40 m was comprised of 72% males. At depths >40 m, the catch was comprised of 71% females. The average length of males and females at depths <30 m was 57 cm and 61 cm, respectively. In the 30-40 m depth range, the average length increased to 64 cm for males and 69 cm for females. At depths >40 m males averaged 68 cm and females averaged 80 cm in fork length.

Length also increased with depth in the Pender Harbour area. The average length of males and females in catches at depths <30 m was 57 cm and 59 cm, respectively. At depths >30 m, males averaged 62 cm and females averaged 83 cm in fork length. The catch at depths <30 m was 65% males while over 30 m females predominated (90%).

Contrary to the 1982-83 tagging in the Stuart Island area, where 54% of the catch was caught at depths <30 m, the majority (94%) of the catch in 1983-84 was caught at depths >30 m. Lingcod from depths <30 m averaged 59 cm for males and 69 cm for females. At depths >30 m males averaged 62 cm and females averaged 70 cm in fork length, respectively.

The difference in the size distribution with depth was tested (Kruskal-Wallis test) for each sex by area. In the Campbell River and Pender Harbour areas the difference was significant for both sexes ($p<0.05$). The difference was not significant in the Stuart Island area ($p>0.05$).

Differences in the size distribution between the 1982-83 and 1983-84 tagging periods were examined (Wilcoxon rank sums test) within the <30 m, 30-40 m and >40 m depth intervals for each of the three release areas (Figs. 2-4). A summary of our results is presented in Table 2.

In the Campbell River area there were declines in mean lengths of females in all depth intervals. The difference between years was slightly significant in the <30 m depth range ($p=0.03$), where mean lengths declined from 75 cm to 71 cm, and highly significant in the >40 m depth range ($p<0.001$) where mean lengths declined from 87 cm to 80 cm. In the 30-40 m depth range mean lengths declined from 73 cm to 68 cm, however, the difference was not significant ($p>0.05$). There were slight declines in mean lengths of males in the 30-40 m and >40 m depth ranges from 65 cm to 64 cm and 69 cm to 68 cm, respectively. The only significant difference in size distribution was in the >40 m depth range ($p<0.05$).

Mean lengths of females in the Pender Harbour area also declined in all depth intervals between years. Mean lengths declined from 69 cm to 60 cm in the <30 m depth, 89 cm to 84 cm in the 30-40 m range and 89 cm to 82 cm in the >40 m range. The difference in size distributions was significant in the <30 m ($p<0.0001$) and >40 m depths ($p<0.05$). There were also declines in mean lengths of males in the <30 m (58 cm to 56 cm) and 30-40 m depth range (65 cm to 63 cm). However, the differences in the size distributions were not significant ($P>0.05$). Small sample sizes of males in the >40 m depth range precluded a similar comparison for males in this area.

Contrary to the declines in mean lengths between years observed in the Campbell River and Pender Harbour areas, there was an increase in mean lengths in the Stuart Island area for females in the <30 m and 30-40 m depth ranges. At depths <30 m females increased from 63 cm to 68 cm and from 65 cm to 70 cm in the 30-40 m depth range. However, the difference in the size distribution at these depths was not significant ($p>0.1$). We could not compare the size distributions of males or females in the >40 m depth range at Stuart Island because of small sample sizes. Males in the <30 m depth range averaged 59 cm and 58 cm in the 1982-83 and 1983-84 tagging periods and 59 cm and 60 cm, respectively, in the 30-40 m depth range. There were no significant differences for males between years at these depths ($P>0.05$). As previously reported, there was a change in the fishing pattern in the Stuart Island area in the second year of tagging. It is not clear how much of the difference in the size distribution between years within each depth interval is attributed to this change.

The decline in catch rates and the size of lingcod in the Campbell River area indicate that there has been a decline in the abundance of lingcod. This is also likely true in the Pender Harbour area, although catch rates were about the same in both years. Increases in the abundance of young (small) lingcod will also produce declines in mean lengths but should result in increases in catch rates. This has not occurred in any of our tagging areas. It is not clear how much of the decline in the abundance of fish between years is attributed to mortality and emigration (dispersion) from the areas fished.

GROWTH

Every third lingcod caught in the Campbell River area and every lingcod exceeding 55 cm from the Pender Harbour area was sampled for age according to the methods of Beamish and Chilton (1977). However, age determinations were not completed for this report.

Estimates of growth were determined from releases in 1982-83 that were recovered during the 1983-84 tagging period. The difference between release and recapture length (growth increment) is plotted against release length in Figure 5. For males less than or equal to 60 cm the increase in growth between 1982-83 and 1983-84 averaged 4.3 cm. At lengths greater than 60 cm, growth averaged 2.0 cm. Females less than or equal to 60 cm in fork length during 1982-83 increased an average of 5.9 cm by 1983-84. Females exceeding 60 cm in length increased an average of 2.9 cm.

TAGGING MORTALITY

Short-term mortality of tagged lingcod was investigated by periodically holding tagged fish in recovery tanks overnight. There were no mortalities of these fish.

Occasionally lingcod were hooked in the throat or gill area when caught. Mortality in these fish was high and these fish were not tagged. The proportion of lingcod hooked in the throat or gill area was estimated to be 2.4%.

TAG RECOVERIES

A total of 215 tagged lingcod were recaptured and re-released during the 1983-84 tagging period (Table 3). Sixty-four percent were recaptured in the Campbell River area, 28% in the Pender Harbour area and 7% in the Stuart Island area. Of the recaptures made while tagging, 85 fish or 40% were tagged during 1982-83.

A total of 105 tags (4%) from the 1983-84 tagging period and 25 tags (1%) from the 1982-83 period were reported by fishermen during the 1984 fishing season. A summary of tag release and recovery information for releases in 1982-83 and 1983-84 is presented in Tables 4 and 5. Tag recoveries reported during the 1984 fishing season by recapture method are presented in Tables 6 and 7. Of the total number of recoveries during the 1984 fishery, 55% were caught by sports fishermen. The proportion of recoveries reported by sports fishermen varied among the three areas. In the Pender Harbour area, 89% of the returns were by sports fishermen. In the Campbell River and Stuart Island areas only 39% and 33% of the returns were by sports fishermen, respectively.

Of the 72 recoveries reported by sports fishermen, 60 (83%) were caught while fishing for lingcod, 11 (15%) were caught incidentally while fishing for salmon and 1 (1%) was caught while fishing for rockfish. Of the 58 lingcod reported by commercial fishermen, 88% were caught while fishing for lingcod (Tables 6 and 7).

Sports and commercial fisheries are selective for different sizes of lingcod. The differences were most apparent in the 1983 fishery when there was a higher abundance of larger fish. During 1983 males averaged 59 cm in length in the sports fishery and 64 cm in the commercial fishery. Females averaged 69 cm and 83 cm, respectively. The difference in the size distributions between the two fisheries was significant (Wilcoxon rank sums test, $p<0.001$). Mean lengths in 1984 sports fisheries were only slightly less than in the commercial fisheries. Mean lengths of males in the sports and commercial fisheries during 1984 were 60 cm and 61 cm, respectively. Females averaged 68 cm and 70 cm. The difference in the size distribution between the two fisheries in 1984 was not significant for either sex ($p>0.05$).

The absence of a significant difference in the size distribution between sports and commercial fisheries in 1984 is attributed to the decline in the abundance of larger fish in 1984 compared to 1983, as discussed earlier. This resulted in a decline in the mean size of tagged fish in commercial landings from 64 cm to 61 cm for males and from 83 cm to 70 cm for females. The difference between the two years was significant for females ($p<0.001$). There was, however, no significant difference in the size distribution in the sports fishery between 1983 and 1984 for either sex ($p>0.01$). These results imply that the commercial fishery targets to a greater extent on larger fish when they are available, while the sports fishery, in general, exploits smaller fish. Biological samples collected from the sports fishery during an independent survey (Cass 1985; Cass unpublished data) had a similar size distribution to the tagged fish reported by sports fishermen in this study.

The proportion of each sex in the sports and commercial fisheries was estimated from the proportion of tagged males and females recovered and released in each of the two years. Sports fisheries in 1983 and 1984 were selective for males. Males accounted for 65% and 62% of the sports catch in 1983 and 1984, respectively. Females were in highest abundance in the commercial fishery accounting for 80% of the catch in 1983 and 56% in 1984.

TAG LOSS

During the 1983-84 tagging period, 28 double-tagged fish were recovered; 21 from releases in 1983-84 and 7 from releases in 1982-83. One double-tagged fish (4%) had lost a tag at the primary tag site, 6 (21%) had lost tags at the secondary site and 21 (72%) were recovered with both tags intact. Three of the 7 double tag recoveries from releases in 1982-83 lost tags at the secondary tag site. There were no double-tagged recoveries from releases in 1982-83 with lost tags at the primary tag site.

During the 1984 fishing season, 21 double-tagged lingcod were reported from the fishery. Fourteen (67%) were recovered with both tags intact, five (24%) lost tags at the secondary tag site and 2 (10%) lost tags at the primary tag site. Five of the recoveries were from tagged lingcod released in 1982-83. Two of these (40%) were recovered with both tags intact, two had lost tags at the secondary tag site and 1 lost tags at the primary tag site.

An overall estimate of tag loss from releases in 1982-83 and 1983-84 was determined by combining the recoveries from the 1983-84 tagging period with recoveries from the 1984 fishery. Tag losses from double-tagged lingcod (n=12) recovered during the second year of liberty (1982-83 releases) were 1 (8%) at the primary tag site and 5 (42%) at the secondary tag site. Tag losses from double-tagged lingcod (n=37) recovered during the first year of liberty (1983-84 releases) were 2 (5%) at the primary tag site and 6 (16%) at the secondary tag site. Tag losses during the first year from releases in 1982-83 were considerably higher (12% at the primary site and 10% at the secondary site) (Cass et al. 1984). We attribute the difference in our estimates of tag losses to differences in tagging skills among the different people involved in our tagging studies.

MOVEMENTS

Of the 99 recoveries reported by specific locations from releases in 1983-84, 95 were recovered within 5 km of the area of release. All the recoveries from 1983-84 releases were made within 40 km from the area of release (Table 8). These results are similar to movements reported for recoveries in the 1983 fishery (Cass et al. 1984).

A total of 18 tagged lingcod released in 1982-83 were recovered and reported by specific location in the 1984 fishery. Fifteen of these (83%) were caught within 5 km of their release and all were recovered within 10 km of their release site.

EXPLOITATION

The primary purpose of this study is to determine the impact of fishing on lingcod stocks in the Strait of Georgia. In this section we

present preliminary estimates of exploitation based on results of the first two years of tagging.

Accurate estimates of exploitation rates are dependent on a number of assumptions; specifically that natural and tagging mortality, tag loss and non-reporting rates are estimable. In this study we have estimated tag loss and have assumed that tagging mortality is negligible. As for natural mortality and non-reporting rates, we have used what we believe are extreme ranges. Accurate estimates of natural mortality rates of lingcod have not been determined. Instantaneous natural mortality (M) determined from catch curve and tagging studies off Vancouver Island (Cass et al. 1983) resulted in an estimate of M=0.26. However, the methods used in that study to estimate M are not very accurate (point estimate). In this study we have applied a range of M's from 0.2 to 0.4 to our estimate of exploitation. We believe this range represents the extreme range of natural mortality of lingcod. We have further assumed that in the 5-6 mo between the winter tagging period and the spring and summer fishery, when most of the lingcod are caught, natural mortality is equal to one-half of the annual rate.

The parameter for which we have the least information is the non-reporting rate. We have applied a 10-50% range of non-reporting to our estimate of exploitation. While we believe non-reporting to be higher than 10% we do not believe it is higher than 50%. We have had repeated personal contacts with sports and commercial fishermen and, with the exception of a few fishermen, the response to our tagging study has been extremely favourable.

Exploitation rates were calculated for 1983 and 1984 from the equation $e = R/M$ (Ricker 1975, eq. 3.1) where e = exploitation rate; R = the number of recoveries; and M = the number of tagged fish. Estimates of tag loss, natural mortality and non-reporting, as determined above, were applied to estimate ranges of exploitation rates (Table 9). Highest levels of exploitation occurred in the Campbell River and Stuart Island areas. Estimates of exploitation rates in both areas ranged from 0.14-0.21. Highest levels in both these areas occurred in 1983. In 1984 exploitation levels at Campbell River and Stuart Island underwent a marked decline to 0.03-0.05 and 0.05-0.07, respectively. Exploitation rates in the Pender Harbour area were similar in both 1983 and 1984 and ranged from 0.10-0.14 and 0.09-0.13 respectively.

OTHER SPECIES

Incidental catches of rockfish, cabezon, kelp greenling, dogfish and octopus were also made during our tagging studies (Table 10). Quillback rockfish (Sebastes maliger) was the most abundant incidentally caught species accounting for 12% of the the total catch including lingcod. Dogfish were the second most frequently caught incidental species accounting for 6% of the total catch. Other species caught less frequently were copper rockfish (2%), yelloweye rockfish (3%), tiger rockfish (0.2%), canary rockfish (1%), cabezon (0.5%), kelp greenling (0.2%), and octopus (0.4%).

Catches of quillback and copper rockfishes were sampled for length, weight, sex, maturity and age. A summary of samples collected is shown in Table 11. These data were collected for an independent study and were not analysed for this report.

ACKNOWLEDGMENTS

We are indebted to the commercial and sports fishermen who promptly returned tags from their recoveries of tagged fish.

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Table 1. Releases of tagged lingcod in the Strait of Georgia during 1983-84a.

Tagging Period	Release area[b]																							
	Shelter Point			Willow Point			Big Rock			Cape Mudge			Discovery Passage South			Seymour Narrows			Discovery Passage North			Pender Harbour			Stuart Island		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Oct. 17-22	2	25	27	-	-	-	-	-	-	-	-	-	10	-	10	50	5	56	20	6	40	-	-	-	-	-	-
Oct. 23-29	3	28	31	28	7	35	21	12	33	2	4	6	4	4	9	-	-	-	-	-	-	-	-	-	-	-	-
Nov. 5-11	2	14	16	31	-	31	-	-	-	-	-	-	5	1	6	52	8	60	-	-	-	-	-	-	-	-	-
Nov. 12-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	63	14	78	22	8	30	-	-	-	-	-	-
Nov. 18-25	41	92	133	50	22	72	9	4	13	3	2	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nov. 27-30	39	50	89	15	6	21	19	11	30	14	31	45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dec. 1- 6	6	12	18	44	53	98	11	43	54	-	12	12	6	-	6	10	1	11	-	-	-	-	-	-	-	-	-
Dec. 7-13	4	30	34	37	35	72	-	-	-	1	1	2	7	3	10	-	-	-	-	-	-	-	-	-	-	-	-
Dec. 14-16	12	34	46	28	10	38	10	1	11	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Jan. 8-14	5	332	27	6	29	35	-	8	8	1	8	9	-	-	-	-	-	-	-	-	-	44	44	89	-	-	-
Jan. 15-20	8	99	107	-	10	10	1	6	7	-	-	-	-	1	1	2	4	6	-	-	-	83	72	155	-	-	-
Jan. 26-31	1	47	48	2	1	3	-	1	1	-	1	1	-	-	-	-	-	-	-	-	-	67	53	120	-	-	-
Feb. 1- 8	7	102	109	5	4	9	-	-	-	-	-	-	-	1	2	-	-	-	-	-	-	97	88	186	-	-	-
Feb. 15-19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34	35	69
Feb. 20-Mar. 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36	63	99
Mar. 4- 7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21	51	72
Mar. 8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	40	54
Total	130	565	695	246	177	424	71	86	157	21	59	80	33	10	45	177	32	211	39	14	70	291	257	550	105	189	294

[a]Unsexed fish may be included in the total column.

[b]Shelter Point, Willow Point, Big Rock, Cape Mudge, Seymour Narrows and Discovery Passage are subareas of the Campbell River release area.

Table 2. Mean length (cm) of male (m) and female (f) lingcod and numbers caught (n) by area and depth for 1982-83 and 1983-84 tag release periods and results of between-year statistical comparisons (Wilcoxon rank sum test) of the size distributions.

		Area					
		Campbell River		Stuart Island		Pender Harbour	
Depth	Release period	m (n)	f (n)	m (n)	f (n)	m (n)	f (n)
<30m	1982-83	58.2 (531)	75.4 (148)	58.3 (66)	62.8 (100)	58.1 (378)	68.9 (155)
	1983-84	58.4 (272)	71.3 (123)	59.1 (20)	67.5 (12)	56.4 (264)	59.8 (147)
	Significance	(p>0.05)	(p<0.05)	(p>0.05)	(p>0.1)	(p>0.05)	(p<0.0001)
30-40m	1982-83	65.1 (251)	73.3 (35)	59.1 (34)	65.4 (66)	64.7 (17)	88.9 (59)
	1983-84	63.8 (151)	68.4 (63)	60.1 (136)	69.8 (70)	63.1 (14)	83.4 (84)
	Significance	(p>0.05)	(p>0.05)	(p>0.05)	(p>0.1)	(p>0.05)	(p>0.05)
>40m	1982-83	68.8 (459)	87.4(1874)	- (0)	57.2 (6)	62.4 (1)	89.4 (17)
	1983-84	67.7 (306)	80.2 (757)	63.4 (63)	70.9 (121)	65.0 (1)	82.3 (12)
	Significance	(p<0.05)	(p<0.001)	(-)	(-)	(-)	(p<0.05)

Table 3. Recoveries of tagged lingcod in the Strait of Georgia by area while tagging in 1983-84.

Tagging Period	Release area[a]																										
	Shelter Point			Willow Point			Big Rock			Cape Mudge			Discovery Passage South			Seymour Narrows			Discovery Passage North			Pender Harbour			Stuart Island		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T
Oct. 17-22	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-
Oct. 23-29	-	2	2	1	-	1	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nov. 5-11	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	2	-	2	-	-	-	-	-	-	-	-	-
Nov. 12-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	8	-	-	-	-	-	-	-	-	-
Nov. 18-25	3	6	9	-	-	-	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nov. 27-30	1	1	2	2	3	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dec. 1- 6	-	2	2	-	1	1	1	1	2	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Dec. 7-13	-	3	3	2	4	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dec. 14-16	-	7	7	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jan. 8-14	-	3	3	1	3	4	-	4	4	-	1	1	-	-	-	-	-	-	-	-	-	7	2	9	-	-	-
Jan. 15-20	-	21	21	-	2	2	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	4	6	10	-	-	-
Jan. 26-31	-	12	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	7	21	-	-	-
Feb. 1- 8	1	29	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	8	20	-	-	-
Feb. 15-19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1	4
Feb. 20-Mar. 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	5	8
Mar. 4- 7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	2	2
Mar. 8-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2
Total	5	88	93	6	13	19	2	12	14	-	1	1	1	-	1	11	-	11	-	-	-	37	23	60	7	9	16

[a]Shelter Point, Willow Point, Big Rock, Cape Mudge, Seymour Narrows and Discovery Passage are subareas of the Campbell River release area.

Table 4. Summary of lingcod tag releases in the Strait of Georgia during 1982-83 and recoveries reported during the 1984 fishing season.

Release area	No. released	No. (%) of double-tagged releases	No. (%) sampled for age	No. (%) of recoveries	No. (%) double -tagged recoveries			
					Total	Both	1°	2°
Campbell River	3055	312 (10.2)	281 (9.2)	13 (0.5)	2 (0.6)	1 (50.0)	-	1 (50.0)
Pender Harbour	633	52 (8.2)	-	4 (0.6)	1 (1.9)	-	1 (100.0)	-
Stuart Island	304	30 (9.9)	-	6 (1.6)	2 (6.7)	1 (50.0)		-

Table 5. Summary of lingcod tag releases in the Strait of Georgia during 1983-84 and recoveries reported during the 1984 fishing season.

Release area	No. released	No. (%) of double-tagged releases	No. (%) sampled for age	No. (%) of recoveries	No. (%) double-tagged recoveries			
					Total	Both	1°	2°
Campbell River	1682	295 (17.5)	566 (33.7)	55 (3.3)	7 (2.4)	4 (57.1)	2 (28.6)	1 (14.3)
Pender Harbour	550	101 (18.4)	346 (62.9)	40 (7.3)	6 (5.9)	5 (83.3)	1 (16.7)	-
Stuart Island	294	61 (20.7)	-	10 (3.4)	3 (4.9)	3 (100.0)	-	-

Table 6. Lingcod tag recoveries reported during the 1984 fishing season by method of capture from releases during 1982-83.

	Release area							
	Campbell River		Pender Harbour		Stuart Island		Total	
Target	N	%	N	%	N	%	N	%
Sport lingcod	8	72.7	2	18.2	1	9.1	11	44.0
Commercial lingcod	8	72.7	1	9.1	2	18.2	11	44.0
Sport rockfish	-	-	-	-	-	-	-	-
Commercial rockfish	-	-	-	-	1	100.0	1	4.0
Sport salmon	-	-	1	100.0	-	-	1	4.0
Incidental to other commercial fisheries	-	-	-	-	1	100.0	1	4.0
Not reported (plant, etc.)	-	-	-	-	-	-	-	-
Total	16		4		5		25	

Table 7. Lingcod tag recoveries reported during the 1984 fishing season by method of capture from releases during 1983-84

	Release area							
	Campbell River		Pender Harbour		Stuart Island		Total	
Target	N	%	N	%	N	%	N	%
Sport lingcod	15	30.6	30	61.2	4	8.2	49	46.7
Commercial lingcod	33	84.6	-	-	6	15.4	39	37.1
Sport rockfish	1	100.0	-	-	-	-	1	1.0
Commercial rockfish	1	100.0	-	-	-	-	1	1.0
Sport salmon	4	40.0	6	60.0	-	-	10	9.5
Incidental to other commercial fisheries	1	25.0	3	75.0	-	-	4	3.8
Not reported (plant, etc.)	-	-	1	100.0	-	-	1	1.0
Total	55		40		10		105	

Table 8. Net movement of tagged lingcod released in the Strait of Georgia during 1983-84 and recovered in the 1984 fishing season.

Km	Campbell River	Pender Harbour	Stuart Island	Total
0	37	35	10	82
<5	9	3	-	12
5-10	2	-	-	2
11-20	1	1	-	2
21-30	-	-	-	-
31-40	1	-	-	1
41-50	-	-	-	-
>50	-	-	-	-
Total	50	39	10	99

Table 9. Preliminary estimates of exploitation rates for lingcod based on tag releases during 1982-83 and 1983-84 and tag recoveries in the 1983 and 1984 fisheries. The estimates were adjusted for tag loss and ranges of natural mortality and non-reporting of tag recaptures[a].

Area	Year	Releases	Viable releases	Recoveries	Estimated recaptures	Exploitation
Campbell River	1983	3123	2229-2463	312	343-468	0.14-0.21
	1984	1772	1318-1457	44	48-66	0.03-0.05
Pender Harbour	1983	692	460-489	43	47-65	0.10-0.14
Harbour	1984	559	431-477	35	39-53	0.08-0.12
Stuart Island	1983	377	222-245	31	34-47	0.14-0.21
Island	1984	281	230-254	10	11-15	0.04-0.07

[a]Tag loss:
1983 = 12% at primary site; 10% at secondary.
1984 = 5% at primary site; 16% at secondary.
Natural mortality:
ranges of M = 0.2-0.4 were applied.
Non-reporting:
ranges of 10%-50% were applied.

Table 10. Incidental catches of species other than lingcod during lingcod tagging studies in the Strait of Georgia during 1983-84.

	Campbell River		Pender Harbour		Stuart Island		Total	
	No	(%)	No	(%)	No	(%)	No	(%)
Rockfish sp.								
Quillback	179	(8.3)	60	(8.8)	179	(22.6)	393	(11.9)
Copper	35	(1.6)	20	(2.9)	0	(-)	55	(1.7)
Yelloweye	10	(0.5)	13	(1.9)	1	(0.1)	24	(2.5)
Tiger	5	(0.2)	0	(-)	0	(-)	5	(0.2)
Canary	0	(-)	6	(0.9)	0	(-)	6	(0.9)
Cabezon	15	(0.7)	3	(0.4)	0	(-)	18	(0.5)
Kelp greenling	6	(0.3)	1	(0.6)	0	(-)	7	(0.2)
Dogfish	168	(8)	13	(1.9)	32	(7)	213	(6.4)
Octopus	1	(0.04)	0	(-)	0	(-)	1	(0.04)

Table 11. Numbers of rockfish sampled for length, weight, maturing, sex and age during lingcod tagging studies in the Strait of Georgia, 1983-84.

	Quillback		Copper	
	M	F	M	F
Campbell River	69	110	17	18
Pender Harbour	79	43	-	-
Stuart Island	13	47	7	13
Total	161	200	24	31

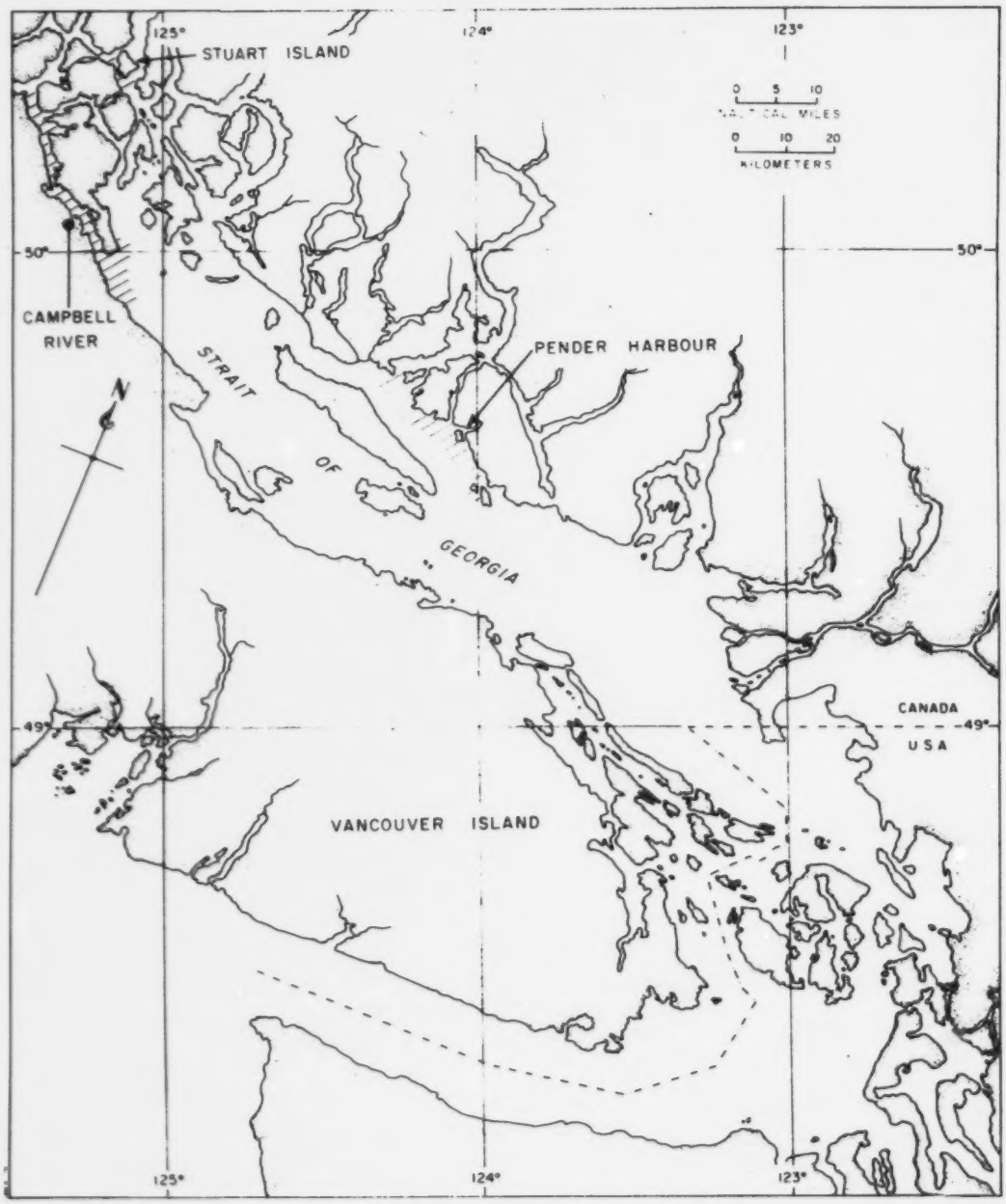

Fig. 1. Lingcod tagging areas in the Strait of Georgia, October 1983-February 1984.

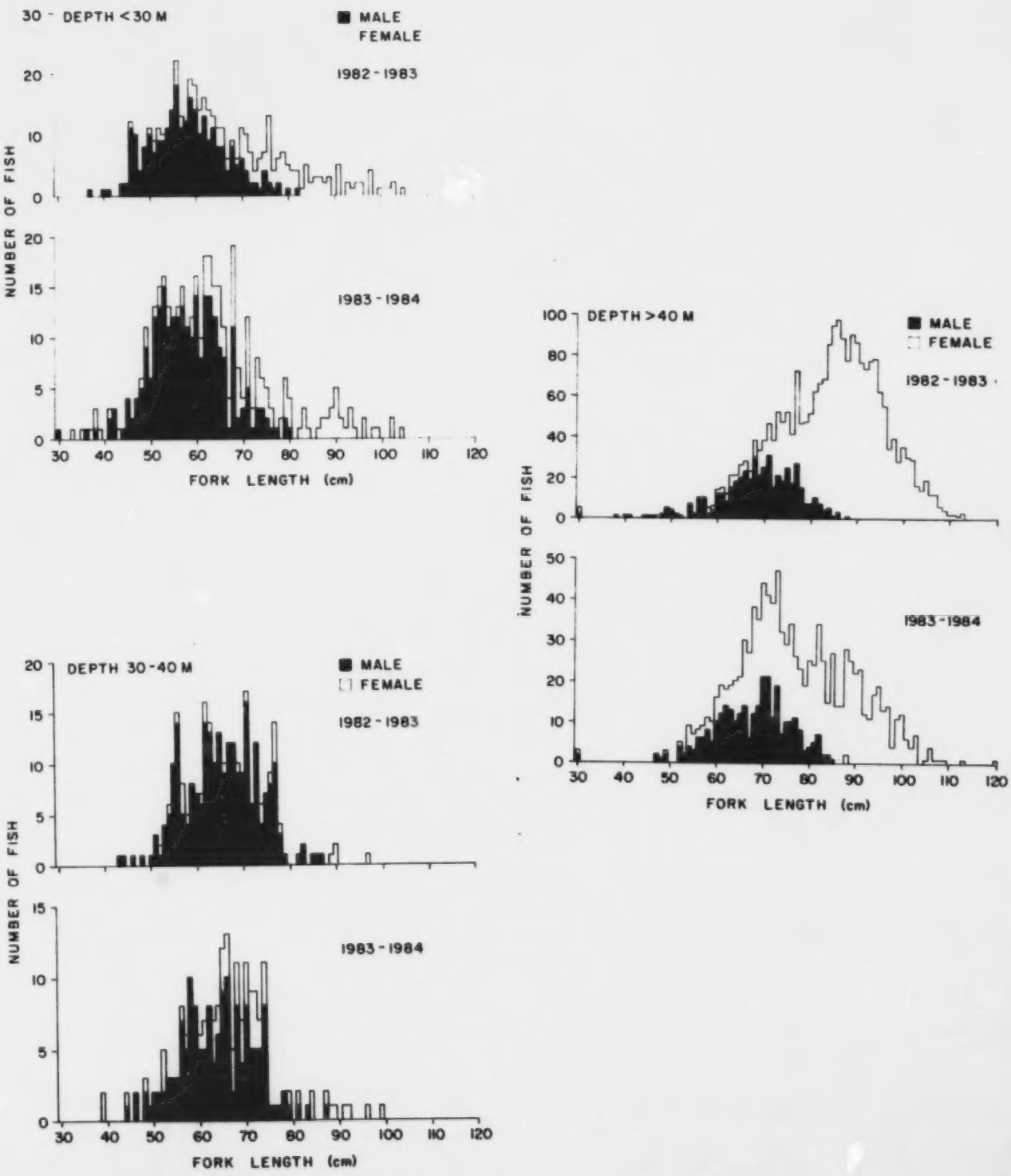

Fig. 2. Length-frequency histograms of tagged lingcod released in the Campbell River area during 1982-83 and 1983-84 at depths < 30 m, 30-40 m and > 40 m.

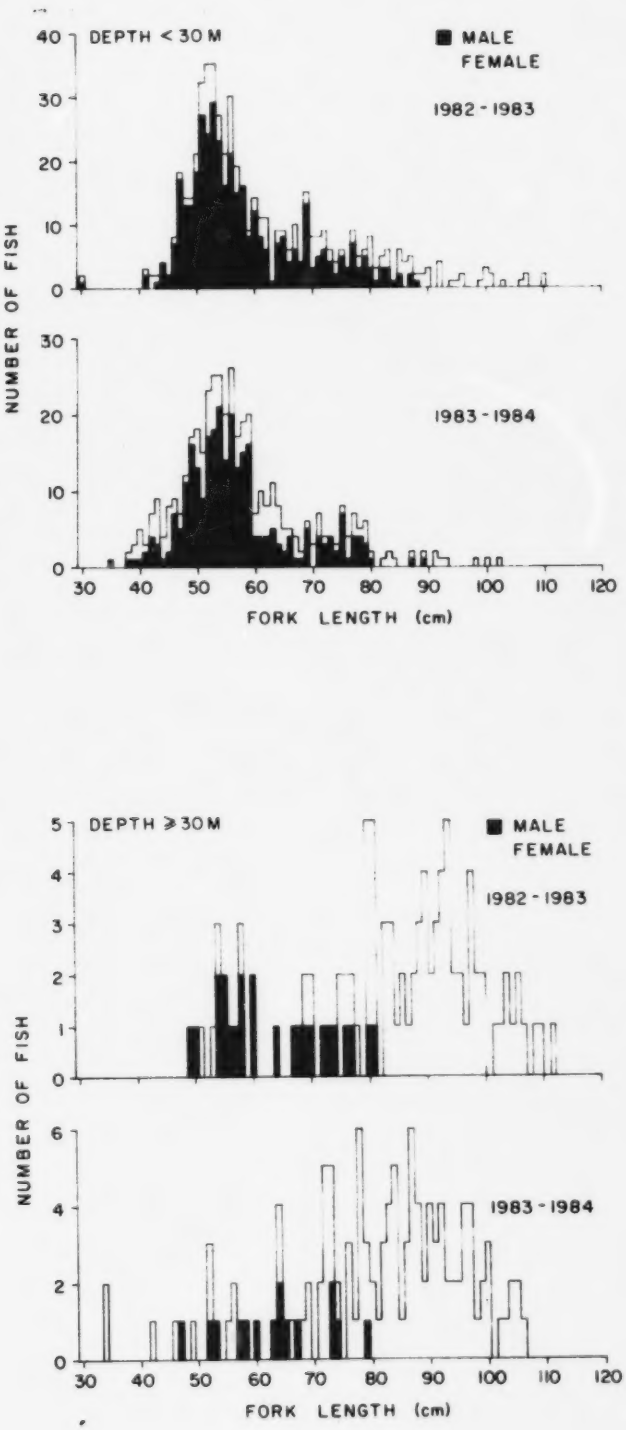

Fig. 3. Length-frequency histograms of tagged lingcod released in the Pender Harbour area during 1982-83 and 1983-84 at depths < 30 m and ≥ 30 m.

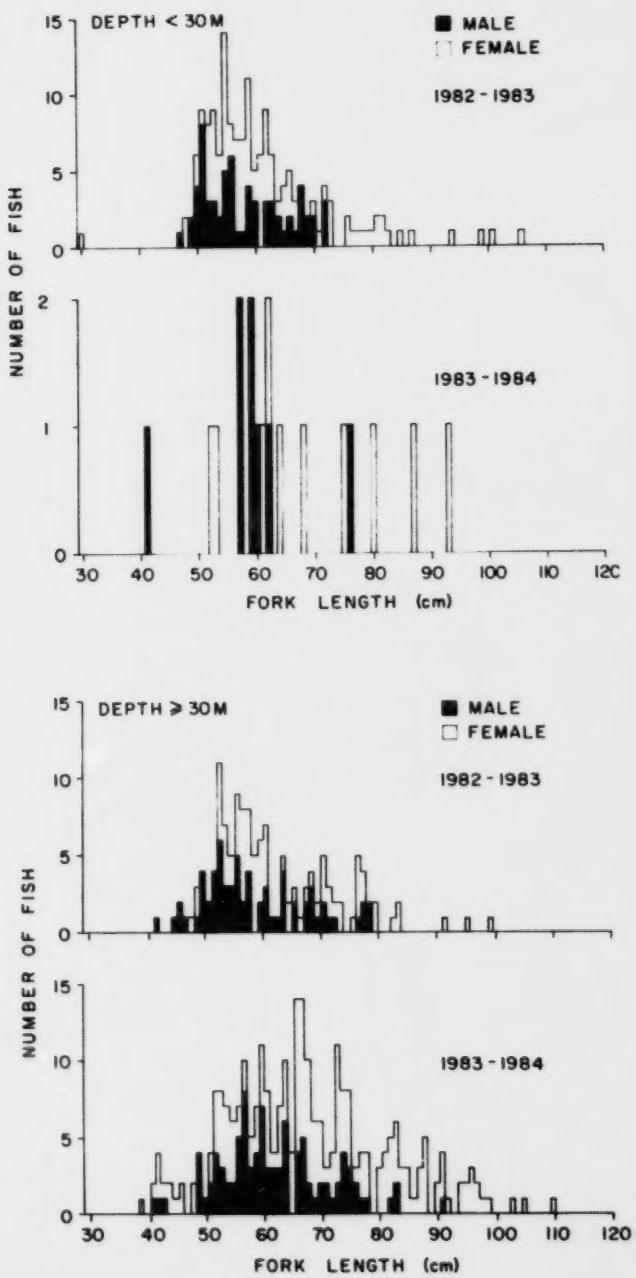

Fig. 4. Length-frequency histograms of tagged lingcod released in the Stuart Island area during 1982-83 and 1983-84 at depths <30 m and ≥30 m.

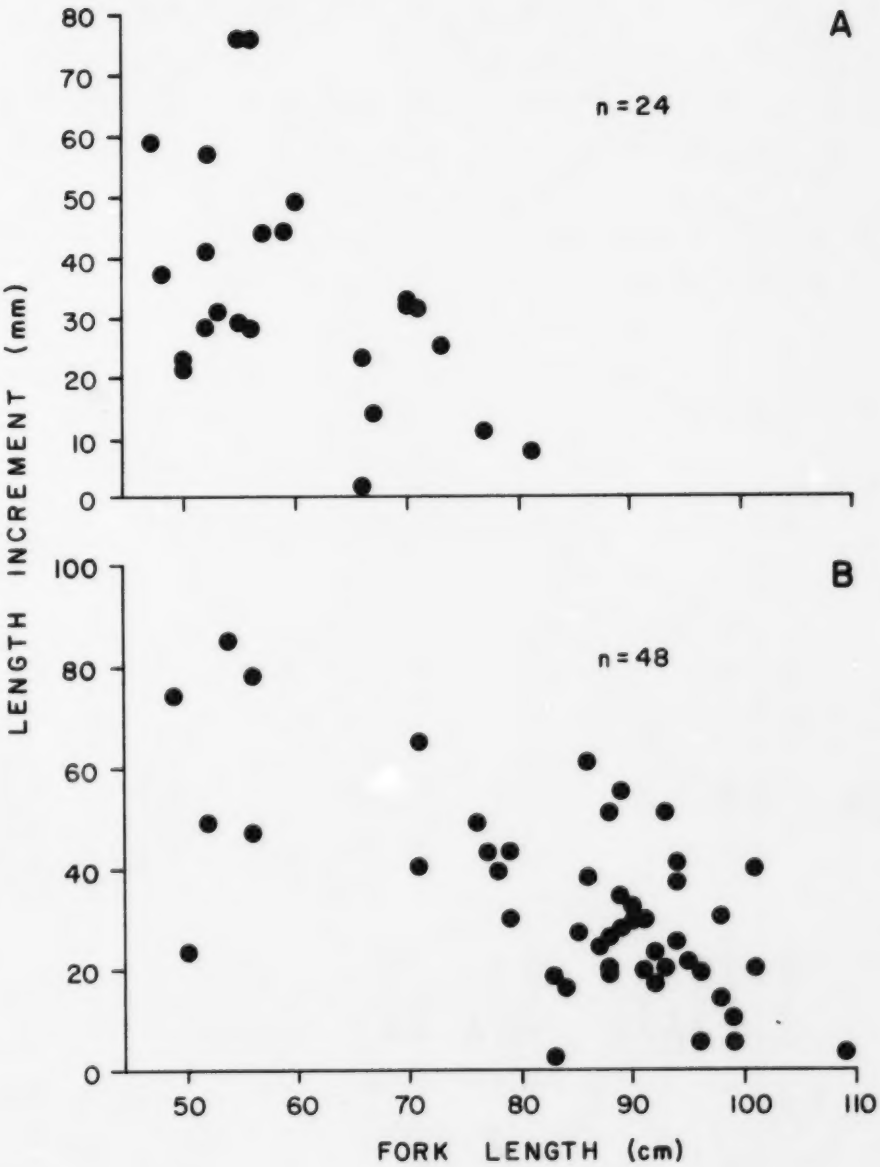

Fig. 5. Length increment of A) male and B) female tagged lingcod released in the Strait of Georgia during 1982-83 and recovered while tagging in 1983-84.

Appendix 1; Table 1. Numbers and identification of tagged lingcod released in the Cambell River area during 1983-84.

Release vessel	Release date	Set No.	Location	Primary tags		Secondary tags		No. fins collected	Cumulative total		
				ID No. B82	No. released	ID No. B82	No. released		1° tags	2° tags	1°+2° tags
MISS QUADRA	Oct. 17/83	1	Discovery Passage South	77851-77874	10	77857	1	3	10	1	11
	"	2	Seymour Narrows	77859-77861	3	-	-	1	13	1	14
	"	3	"	77862	1	-	-	1	14	1	15
	"	4	"	77863-77870	7	77864	1	2	21	2	23
	"	5	Discovery Passage South	77875-77878	4	-	-	1	25	2	27
	Oct. 18/83	6	Seymour Narrows	77879-77903	23	77889-77900	2	7	48	4	52
	"	9	"	77904-77915	11	77914	1	3	59	5	64
	"	10	"	77916	1	-	-	-	60	5	65
	Oct. 19/83	11	"	77917-77928	10	77927	1	3	70	6	76
	"	12	Discovery Passage North	77929-77933	5	-	-	-	75	6	81
	"	13	"	77934-77939	6	-	-	-	81	6	87
	"	14	"	77940-77941	2	-	-	-	83	6	89
	"	15	"	77942	1	-	-	-	84	6	90
	"	17	"	77943	1	-	-	-	85	6	91
	Oct. 20/83	19	"	77944-77960	16	77954	1	5	101	7	108
	"	21	"	77961-77965	5	77966	1	1	106	8	114
	Oct. 22/83	26	Shelter Pt.	77967-77999	27	77979-77989	2	9	133	10	143
	Oct. 23/83	27	"	78000-78011	11	78003-78012	2	4	144	12	156
	"	28	Cape Mudge	78013-78019	6	78014	1	2	150	13	163

Appendix 1; Table 1 (cont'd)

Release vessel	Release date	Set No.	Location	Primary tags		Secondary tags		No. fins collected	Cumulative total		
				ID No. B82	No. released	ID No. B82	No. released		1° tags	2° tags	1°+2° tags
MISS QUADRA	Oct. 27/83	31	Discovery Passage South	78020-78022	3	-	-	1	153	13	166
	"	32	"	78023-78026	4	-	-	1	157	13	170
	"	33	"	78027	1	-	-	-	158	13	171
	"	36	"	78028-78029	1	-	-	-	159	13	172
	Oct. 28/83	38	Big Rock	78030-78045	14	78031-78041	2	5	173	15	188
	"	39	Willow Pt.	78046-78079	31	78056-78078	3	10	204	18	222
	Oct. 29/83	41	Big Rock	78080-78100	19	78081-78091	2	7	223	20	243
	"	42	Shelter Pt.	78101-78122	20	78102-78123	3	8	243	23	266
	"	43	Willow Pt.	78124-78128	4	78125	1	2	247	24	271
	Nov. 5/83	45	Seymour Narrows	78129-78153	22	78136-78147	2	7	269	26	295
	"	46	"	78154-78159	5	78155	1	2	274	27	301
	Nov. 6/83	47	"	78160-78164	2	78163	1	1	276	28	308
	"	51	"	78165-78170	6	78171	1	1	282	29	311
	"	52	"	78172	1	-	-	-	283	29	312
	Nov. 7/83	54	Willow Pt.	78173-78212	31	78184-78210	3	9	314	32	346
	"	55	Shelter Pt.	78213-78232	16	78222	1	5	330	33	363
	Nov. 8/83	56	Seymour Narrows	78233-78260	24	78235-78255	3	8	354	36	390
	Nov. 11/83	57	Discovery Passage South	78261-78268	6	78267	1	2	360	37	397

Appendix 1; Table 1 (cont'd)

Release vessel	Release date	Set No.	Location	Primary tags ID No. B82	Primary tags No. released	Secondary tags ID No. B82	Secondary tags No. released	No. fins collected	Cumulative total 1° tags	Cumulative total 2° tags	Cumulative total 1°+2° tags
MISS QUADRA	Nov. 12/83	58	Seymour Narrows	78269	1	-	-	1	361	37	398
	"	59	"	78270-78298	24	78278-78299	3	8	385	40	425
	"	60	"	78300-78311	9	78309	1	2	394	41	435
	Nov. 13/83	61	"	78312-78332	17	78320-78333	2	6	411	43	454
	"	62	"	78334-78353	16	78344	1	5	427	44	471
	Nov. 14/83	64	"	78354-78356	2	78355	1	1	429	45	474
	"	66	"	78357-78360	4	-	-	1	433	45	478
	"	68	"	78361-78364	3	-	-	1	436	45	481
	"	69	"	78363-78365	2	-	-	-	438	45	483
	Nov. 15/83	70	Discovery Passage North	78366-78401	30	78367-78390	3	10	468	48	516
	Nov. 18/83	71	Big Rock	78402-78408	4	78404	1	2	472	49	521
	"	72	Shelter Pt.	78409-78425	10	78413-78420	2	3	482	51	533
	"	73	Cape Mudge	78426	1	-	-	1	483	51	534
	"	74	Big Rock	78427-78431	3	78432	1	1	486	52	538
	Nov. 19/83	75	Willow Pt.	78433-78434	2	784335	1	1	488	53	541
	"	76	Shelter Point	78436-78486	13	78439-78445	2	4	501	55	556
	"	77	Willow Pt.	78450-78483	28	78451-78481	6	9	529	61	590
	Nov. 20/83	78	Big Rock	78484-78492	6	78488-78491	2	2	535	63	598
	"	79	Willow Pt.	78493-78590	49	78495-78527	6	11	567	69	636

Appendix 1; Table 1 (cont'd)

Release vessel	Release date	Set No.	Location	Primary tags		Secondary tags		No. fins collected	Cumulative total		
				ID No. B82	No. released	ID No. B82	No. released		1° tags	2° tags	1°+2° tags
MISS QUADRA	Nov. 21/83	80	Shelter Pt.	78531-78590	49	78532-78588	10	16	616	79	695
	Nov. 24/83	81	"	78591-78638	38	78593-78635	8	13	654	87	741
	Nov. 25/83	82	"	78639-81644	10	78641-78649	2	4	664	89	751
	"	83	"	78651-78664	12	78653-78662	2	4	676	91	765
	"	84	"	78665	1	-	-	-	677	91	768
	"	85	Cape Mudge	78666-78670	4	78668	1	2	681	92	773
	"	86	Willow Pt.	78671-78682	10	78675-78680	2	2	691	94	785
	Nov. 27/83	87	"	78719-78730	10	78721-78729	2	4	701	96	797
	"	88	Shelter Pt.	78731-81859	10	78733-78740	2	3	711	98	809
	"	89	Big Rock	78683-78717	30	78685-78718	6	10	741	104	845
	Nov. 28/83	90	Shelter Pt.	78743-78747	4	78746	1	2	745	105	850
	"	91	"	78748	1	-	-	1	746	105	851
	"	92	"	78749-78798	42	78751-78796	8	12	788	113	901
	Nov. 29/83	93	Cape Mudge	78799-78837	33	78801-78833	6	11	821	119	940
	"	95	Shelter Pt.	78838-78849	10	78840-78847	2	4	831	121	952
	"	96	Willow Pt.	78850-78862	11	78852-78860	2	4	842	123	965
	Nov. 30/83	97	Cape Mudge	78863-78876	12	78866-78877	3	4	854	126	980
	"	98	Shelter Pt.	78878-78903	22	78880-78901	4	8	876	130	1006

Appendix 1; Table 1 (cont'd)

Release vessel	Release date	Set No.	Location	Primary tags ID No. B82	Primary tags No. released	Secondary tags ID No. B82	Secondary tags No. released	No. fins collected	Cumulative total 1° tags	Cumulative total 2° tags	Cumulative total 1°+2° tags
MISS QUADRA	Dec. 1/83	99	Discovery Passage South	78904-78911	6	78906	1	2	882	131	1013
	"	101	Seymour Narrows	78912-78924	11	78914-78922	2	4	893	133	1026
	Dec. 3/83	102	Big Rock	78925-78960	26	78926-78959	6	9	919	139	1058
	Dec. 4/83	104	Mudge Big Rock	78975-81410	28	78976-81409	6	9	959	147	1106
	Dec. 5/83	106	Shelter Pt.	81411-81432	18	81412-81430	4	6	977	151	1128
		107	Willow Pt.	81433-81465	36	81436-81462	5	9	1003	156	1159
	Dec. 6/83	108	"	81466-81553	72	81469-81459	14	24	1075	170	1245
	Dec. 7/83	109	"	81554-81569	12	81555-81568	3	4	1087	173	1260
	"	110	"	81570-81589	17	81574-81586	3	6	1104	176	1280
	Dec. 8/83	113	Discovery Passage South	81590	1	-	-	-	1105	176	1281
	"	114	"	81591	1	-	-	-	1106	176	1282
	"	115	"	81592-81599	7	81595	1	3	1113	177	1290
	"	117	"	81600	1	-	-	-	1114	177	1291
	Dec. 9/83	119	Shelter Pt.	81601-81604	3	81602	1	11	1117	178	1292
	"	109	"	81605-81645	31	81608-91640	6	11	1148	184	1332
	Dec. 10/83	121	Willow Pt.	81646-81663	15	81648-81660	3	5	1163	187	1350
	"	122	"	81664-81670	6	81666	1	2	1169	188	1357

Appendix 1; Table 1 (cont'd)

Release vessel	Release date	Set No.	Location	Primary tags ID No. B82	Primary tags No. released	Secondary tags ID No. B82	Secondary tags No. released	No. fins collected	Cumulative total 1° tags	Cumulative total 2° tags	Cumulative total 1°+2° tags
MISS QUADRA	Dec. 13/83	123	Cape Mudge	81672-81674	2	81673	1	1	1171	189	1360
	"	124	Willow Pt.	81675-81700	22	86178-81696	4	7	1193	193	1386
	Dec. 14/83	125	Shelter Pt.	81701-81730	23	81702-81728	5	8	1216	198	1414
	"	126	Willow Pt.	81731-81742	10	81734-81740	2	4	1226	200	1426
	Dec. 15/83	127	Shelter Pt.	81734-81767	21	81746-81764	4	7	1247	204	1451
	"	128	Willow Pt.	81768-81772	4	81770	1	1	1251	205	1456
	Dec. 16/83	129	Big Rock	81773	1	-	-	1	1252	205	1455
	"	130	Willow Pt.	81774-81803	24	81776-81801	5	7	1276	210	1486
	"	131	Shelter Pt.	81804-81805	2	-	-	1	1278	210	1488
	"	132	Discovery Passage South	81700	1	-	-	-	1279	210	1489
	"	133	Big Rock	81806-81816	10	81811-81817	2	3	1289	212	1499
	Jan. 8/84	134	"	81818-81828	8	81819-81826	2	3	1297	214	1511
	Jan. 11/84	135	Shelter Pt.	81829	1	81830	1	1	1298	215	1513
	"		Willow Pt.	81831-81845	13	81836-81842	2	4	1311	217	1528
	"		Shelter Pt.	81846-81867	16	81848-81861	3	5	1327	220	1547
	Jan. 12/84	138	Cape Mudge	81868-81873	5	81869	1	2	1332	221	1553
		139		81874-81878	4	81875	1	2	1336	222	1558
	"	140	Willow Pt.	81879-81884	5	81881	1	2	1341	223	1564

Appendix 1; Table 1 (cont'd)

Release vessel	Release date	Set No.	Location	Primary tags ID No. B82	Primary tags No. released	Secondary tags ID No. B82	Secondary tags No. released	No. fins collected	Cumulative total 1° tags	Cumulative total 2° tags	Cumulative total 1°+2° tags
MISS QUADRA	Jan. 13/84	141	Willow Pt.	81885-81892	7	81890	1	2	1348	224	1572
	"	143	Shelter Pt.	81893-81901	8	81896	1	2	1356	225	1581
	Jan. 14/84	144	"	81902-81917	12	81903-81916	3	4	1368	228	1596
	"	145	Willow Pt.	81918-81929	10	81922-81928	2	4	1378	230	1608
	Jan. 15/84	146	Shelter Pt.	81930-81943	12	81935-81941	2	4	1390	232	1622
	"	148	Willow Pt.	81944-81955	9	81947-81954	2	3	1399	234	1633
	"	149	"	81956	1	-	-	-	1400	234	1634
	Jan. 16/83	150	Seymour Narrows	81957-81959	3	81960	1	1	1403	235	1638
		152	"	81961-81963	3	-	-	1	1406	235	1641
		154	Discovery Passage South	81964	1	-	-	-	1407	235	1642
	Jan. 17/84	155	Big Rock	81965-81972	7	81966	1	3	1414	236	1650
	"	156	Shelter Pt.	68025-68044 81973-81999	36	68029-68042 81977-81998	7	11	1450	243	1693
	Jan. 18/84	157	Shelter Pt.	68010-18011 68045-68092	38	68048-68093	8	13	11488	251	1739
	Jan. 19/84	158	"	68094-68111	15	68099-68112	3	6	1503	254	1757
	Jan. 20/84	159	"	68113-68120	6	68119	1	2	1509	755	1764
	Jan. 28/84	161	"	68125-68152	23	68127-68151	5	8	1532	260	1792
	"	162	Willow Pt.	68153	1	-	-	1	1533	260	1793

Appendix 1; Table 1 (cont'd)

Release vessel	Release date	Set No.	Location	Primary tags ID No. B82	Primary tags No. released	Secondary tags ID No. B82	Secondary tags No. released	No. fins collected	Cumulative total 1° tags	Cumulative total 2° tags	Cumulative total 1°+2° tags
MISS QUADRA	Jan. 29/84	163	Big Rock	68154	1	-	-	1	1534	260	1794
	"	164	Willow Pt.	68155	1	68156	1	1	1535	261	1796
	"	166	Cape Mudge	68157	1	-	-	-	1536	261	1797
	"	168	Shelter Pt.	68158-61888	25	68160-68189	7	9	1561	268	1829
	Jan. 30/84	169	Willow Pt.	68190	1	-	-	-	1562	268	1830
	Feb. 1/84	171	Shelter Pt.	68191-68250	27	68197-68248	6	9	1589	274	1863
	Feb. 2/84	172	Willow Pt.	68251-68252	2	-	-	1	1591	274	1865
	"	173	Shelter Pt.	68200-68273	21	68203-68274	6	10	1612	280	1892
	Feb. 3/84	174	"	68205-68291	25	68207-68288	6	10	1637	286	1923
	Feb. 4/84	175	"	68292-68295	3	68294	1	1	1640	287	1927
	"	176	Willow Pt.	68296	1	-	-	1	1641	287	1928
	Feb. 6/84	177	Shelter Pt.	68297-68337	33	68299-68335	7	14	1674	294	1968
	Feb. 7/84	178	Willow Pt.	68339-68346	6	68342	1	3	1680	295	1975
	"	179	Discovery Passage South	18347-68351	2	-	-	-	1682	295	1977

Appendix 1; Table 2. Numbers and identification of tagged lingcod released off Stuart Island, February 15 to March 10, 1984.

Release vessel (FBI)	Release date	Set No.	Location	Primary tags ID No. B82	Primary tags No. released	Secondary tags ID No. B82	Secondary tags No. released	No. fins collected	Cumulative total 1° tags	Cumulative total 2° tags	Cumulative total 1°+2° tags
FRAZER BELLE	Feb. 15	02	Stuart Island	92000-92001	2	-	-	-	2	-	2
	"	04	"	92002-92004	3	-	-	-	5	-	5
	"	05	"	92005-92007	2	92006	1	-	7	1	8
	"	06	"	92008	1	-	-	-	8	1	9
	"	07	"	92009-92012	3	91010	1	-	11	2	13
	Feb. 16	08	"	92013	1	-	-	-	12	2	14
	"	09	"	92014-92028	12	92016-92026	3	-	24	5	29
	"	10	"	92030	1	-	-	-	25	5	30
	Feb. 17	11	"	92031-92033	3	-	-	-	28	5	33
	"	12	"	92034-92044	9	92035-92045	3	-	37	8	45
	Feb. 18	13	"	92046-92056	9	92049-92054	2	-	46	10	56
	"	14	"	92057-92063	6	92062	1	-	52	11	63
	Feb. 19	15	"	92064-92071	7	92066-92072	2	-	59	13	72
	"	16	"	92073-92078	5	92077	1	-	64	14	78
	"	17	"	92079	1	-	-	-	65	14	79
	"	18	"	92080-92084	4	92085	1	-	69	15	84
	Feb. 20	19	"	92086-92096	8	92090-92095	2	-	77	17	94
	"	20	"	92097-92099	3	-	-	-	80	17	97
	"	21	"	92100-92125	21	92101-92121	5	-	101	22	123
	"	22	"	92126-92129	4	-	-	-	105	22	127
	Feb. 21	23	"	92130-92148	15	92132-92147	4	-	120	26	146
	Mar. 1	24	"	92149-92150	2	-	-	-	122	26	148

Appendix 1; Table 2 (cont'd)

Release vessel (FBI)	Release date	Set No.	Location	Primary tags ID No. B62	Primary tags No. released	Secondary tags ID No. B82	Secondary tags No. released	No. fins collected	Cumulative total 1° tags	Cumulative total 2° tags	Cumulative total 1°+2° tags
FRAZER BELLE	Mar. 2	25	Stuart	92151-92164	11	92153-92162	3	-	133	29	162
	"	27	Island	92165-92166	2	92167	1	-	135	30	165
	"	28	"	92168-92179	10	92170-92180	3	-	145	33	178
	Mar. 3	29	"	92181	1	-	-	-	146	33	179
	"	30	"	92182-92189	6	92186	1	-	152	34	186
	"	31	"	92190-92209	16	92192-92206	3	-	168	37	205
	Mar. 4	33	"	92210-92215	5	92212	1	-	173	38	211
	"	34	"	92216-92218	3	-	-	-	176	38	214
	"	35	"	92219-92229	8	92224-92228	2	-	184	40	224
	"	36	"	92230	1	-	-	-	185	40	225
	Mar. 5	37	"	92231-92236	5	92233-92237	2	-	190	42	232
	"	38	"	92238-92244	6	92243	1	-	196	43	239
	"	39	"	92245-92247	3	-	-	-	199	43	242
	"	40	"	92248-92253	5	92251	1	-	204	44	248
	Mar. 6	41	"	92254-92264	9	92259-92263	2	-	213	46	259
	"	42	"	92265-92268	4	-	-	-	217	46	263
	"	43	"	92269-92270	2	-	-	-	219	46	265
	"	44	"	92271-92280	8	92279-92281	2	-	227	48	275
	Mar. 7	45	"	92282-92286	4	92284	1	-	231	49	280
	"	46	"	92287-92288	2	-	-	-	233	49	282
	"	47	"	92289-92297	7	92291-92298	2	-	240	51	291
	Mar. 8	49	"	92299-92309	8	92304-92308	2	-	248	53	301
	"	50	"	92310-92322	11	92314-92320	2	-	259	55	314
	"	51	"	92323-92324	2	-	-	-	261	55	316

Appendix 1; Table 2 (cont'd)

Release vessel (FBI)	Release date	Set No.	Location	Primary tags ID No. B82	Primary tags No. released	Secondary tags ID No. B82	Secondary tags No. released	No. fins collected	Cumulative total 1° tags	Cumulative total 2° tags	Cumulative total 1°+2° tags
FRAZER	Mar. 9	52	Stuart	92325	1	-	-	-	262	55	317
BELLE	"	53	Island	92356-92327	2	-	-	-	264	55	319
	"	54	"	92328-92344	12	92329-92340	3	-	276	58	334
	"	55	"	92345-92349	3	92348	1	-	279	59	338
	Mar. 10	56	"	92350-92351	2	-	-	-	281	59	340
	"	57	"	92352-92374	13	92354-92359	2	-	294	61	355

Appendix 1; Table 3. Numbers and identification of tagged lingcod released in Pender Harbour area January 13- February 8, 1984.

Release vessel	Release date	Set No.	Location	Primary tags		Secondary tags		No. fins collected	Cumulative total		
				ID No. B82	No. released	ID No. B82	No. released		1° tags	2° tags	1°+2° tags
BREAKAWAY	Jan. 13/84	1	Bjerre Shoal	82001-82029	24	82007-82027	5	22	24	5	29
	"	2	Harness Is-Secret Cove	82030	1	-	-	1	25	5	30
	"	3	Bjerre Shoal	82032-82034	3	-	-	3	28	5	33
	"	4	"	82035-82054	17	82036-82051	3	17	45	8	-
	"	5	"	82055-82069 82307	13	82056-82067	2	11	58	10	68
	Jan. 14/84	6	"	82070-82076	6	82071	1	4	64	11	75
	"	8	Epson Pt.	82077-82085	8	82079-82086	2	8	72	13	85
	"	9	"	82087-82095	8	82091	1	5	80	14	94
	"	10	"	82096-82106	9	82101	1	9	89	15	104
	Jan. 15/84	11	Bjerre Shoal	82107-82116	9	82109-82117	2	9	98	17	115
	"	12	"	82118-82127 83118-83124	14	82124-82119	2	10	112	19	131
	"	13	"	82128-82139	10	82131-82138	2	8	122	21	143
	"	17	Harness Is-	82140	1	-	-	1	123	21	144
	"	18	Secret Cove	82141-82142	2	-	-	2	125	21	146
	Jan. 16/84	19	Epsom Pt.	82143-82161	16	82144-82157	3	16	141	24	165
	"	21	"	82162-82170	8	82165	1	6	149	25	174
	"	22	"	82171-82173	3	82174	1	2	152	26	178
	"	23	Harness Is-Secret Cove	82175-82179	4	82176	1	4	156	27	183
	Jan. 17/84	24	"	82180-82198	16	82185-82194	3	13	172	30	202
	"	27	Welcome Pass	82199-82216	15	82201-82213	3	8	187	33	220

Appendix 1; Table 3 (cont'd)

Release vessel	Release date	Set No.	Location	Primary tags ID No. B82	Primary tags No. released	Secondary tags ID No. B82	Secondary tags No. released	No. fins collected	Cumulative total 1° tags	Cumulative total 2° tags	Cumulative total 1°+2° tags
BREAKAWAY	Jan. 18/84	28	Quarry Bay	82217-82218	2	82219	1	2	189	34	223
	"	30	"	82220-82222	3	-	-	1	192	34	226
	"	31	"	82223-82225	3	-	-	3	195	34	229
	"	32	"	82226-82235	9	82228-82236	2	5	204	36	240
	"	34	"	82237	1	-	-	1	205	36	241
	"	37	"	82238	1	-	-	-	206	36	242
	Jan. 19/84	38	Deep Bay	82239-82240	2	82241	1	2	208	37	245
	"	40	Bjerre Shoal	82242-82245	4	82246	1	1	212	38	250
	"	41	"	82247-82250	4	82254	1	4	216	39	255
	"	42	"	82251	1	-	-	1	217	39	256
	"	44	Harness Is-Secret Cove	82252-82257	5	-	-	3	222	39	261
	Jan. 20/84	47	Epsom Pt.	82258-82283	22	82260-82280	4	11	244	43	287
	Jan. 26/84	48	Bjerre Shoal	82285-82305	17	82290-82303	3	5	261	46	307
	"	49	"	82306-82313	6	83410	1	2	267	47	314
	"	50	"	82314-82319	4	82316	1	3	271	48	319
	"	52	Harness Is-Secret Cove	82320-82322	3	82323	1	1	274	49	323
	Jan. 27/84	54	Bjerre Shoal	82325-82328	4	-	-	3	278	49	327
	"	55	"	82329-82331	2	82330	1	-	280	50	330
	"	57	"	82332-82339	7	82336	1	7	287	51	338
	"	58	"	82340-82346	6	82342	1	3	293	52	345

Appendix 1; Table 3 (cont'd)

Release vessel	Release date	Set No.	Location	Primary tags ID No. B82	Primary tags No. released	Secondary tags ID No. B82	Secondary tags No. released	No. fins collected	Cumulative total 1° tags	Cumulative total 2° tags	Cumulative total 1°+2° tags
BREAKAWAY	Jan. 28/84	59	Harness Is-Secret Cove	82347-82348	2	-	-	3	293	52	345
	"	60	Epsom Pt.	82349	1	-	-	1	296	52	348
	"	61	"	82350-82356	6	82351-82357	2	3	302	54	356
	"	62	"	82358-82369	9	82364	1	5	311	55	366
	"	63	"	82370-82382	11	82371-82384	3	5	322	58	380
	Jan. 29/84	64	Bjerre Shoal	82385-82386	2	-	-	-	324	58	382
	"	67	Welcome Pass	82387	1	-	-	-	325	58	383
	"	69	"	82388-82392	4	82390	1	3	329	59	388
	"	71	Bjerre Shoal	82392-82395	3	82396	1	1	332	60	392
	Jan. 30/84	72	SE Texada	82397-82404	7	82402	1	3	339	61	400
	"	73	"	82405-82414	8	82408-82415	2	7	347	63	410
	"	74	"	82416-82419	4	-	-	-	351	63	414
	"	75	"	82402-82422	2	82421	1	2	353	64	417
	"	76	"	82423-82425	3	82426	1	2	356	65	421
	"	77	"	82427-82433	6	82432	1	2	362	66	428
	Jan. 31/84	80	Epsom Pt.	82434-82435	2	-	-	2	364	66	430
	Feb. 3/84	81	Seal Reef	82436-82449	12	82441-82447	2	12	376	68	444
	"	82	"	82450-82467	14	82453-82466	3	7	390	71	461
	Feb. 4/84	83	Harness Is-Secret Cove	82468-82482	16	82471-82484	3	11	406	74	480
	"	84	"	82488-82493	5	82490	1	5	411	75	486
	"	85	"	82494-82501	7	82496-82502	2	3	418	77	495
	"	86	"	82503-82505	3	-	-	-	421	77	498
	"	87	Pender Harbour	82506	1	-	-	-	422	77	499

Appendix 1; Table 3 (cont'd)

Release vessel	Release date	Set No.	Location	Primary tags ID No. B82	Primary tags No. released	Secondary tags ID No. B82	Secondary tags No. released	No. fins collected	Cumulative total 1° tags	Cumulative total 2° tags	Cumulative total 1°+2° tags
BREAKAWAY	Feb. 5/84	89	Harness Is-	82508-82521	12	82512-82519	2	11	434	79	513
	"	90	Secret Cove	82522-82527	5	82526	1	5	439	80	519
	"	91	"	82528-82537	9	82533	1	6	448	81	529
	"	92	"	82538-82541	4	82542	1	1	452	82	534
	Feb. 6/84	93	Epsom Pt.	82543-82572	24	82544-82663	5	15	476	87	563
	"	94	"	82573-82585	10	82575-82582	2	-	486	89	575
	"	95	Bjerre Shoal	82586	1	-	-	-	487	89	576
	"	97		82527-82593	6	82588-82594	2	2	493	91	584
	Feb. 7/84	98	Welcome Pass	82595-82603	8	82600	1	-	501	92	593
	"	99	"	82604-82620	13	82606-82619	3	6	514	95	609
	"	100	"	82621-82624	4	82625	1	-	518	96	614
	"	101	Harness Is-	82626-82632	6	82631	1	3	524	97	621
	"	1102	Secret Cove	82633-82637	5	-	-	-	529	97	627
	Feb. 8/84	103	"	82638-82659	19	82642-82660	4	4	548	101	650
	"	104	"	82661-81662	2	-	-	-	550	101	652
Total								346			

Appendix 2; Table 1. Length frequencies of lingcod by area caught during tagging studies in the Strait of Georgia, 1983-84.

AREA FORK LENGTH (CM)	SHELTER POINT			WILLOW POINT			BIG ROCK			CAPE MUDGE		
	M	F	T	M	F	T	M	F	T	M	F	T
32	-	-	-	-	-	-	-	-	-	-	-	-
33	-	-	-	-	-	-	-	-	-	-	-	-
34	-	-	-	-	-	-	-	-	-	-	-	-
35	-	-	-	-	-	-	-	-	-	-	-	-
36	-	-	-	-	-	-	-	-	-	-	-	-
37	-	-	-	-	-	-	-	-	-	-	-	-
38	-	-	-	-	-	-	-	-	-	-	-	-
39	-	-	-	-	1	1	-	-	-	-	-	-
40	-	-	-	-	0	0	-	-	-	-	-	-
41	-	-	-	-	0	0	-	-	-	-	-	-
42	-	-	-	-	0	0	-	-	-	-	-	-
43	-	-	-	-	0	0	-	-	-	-	-	-
44	-	-	-	-	1	1	-	-	-	-	-	-
45	-	-	-	-	0	0	-	-	-	-	-	-
46	1	-	1	-	0	0	-	-	-	-	-	-
47	0	-	0	2	0	2	-	-	-	-	-	-
48	0	-	0	2	0	2	-	-	-	-	-	-
49	0	-	0	2	2	4	-	-	-	-	-	-
50	0	-	0	1	0	1	1	-	1	-	-	-
51	1	-	1	1	0	1	1	-	1	1	-	1
52	1	1	2	4	2	6	1	-	1	0	-	0
53	0	0	0	2	0	2	1	-	1	2	-	2
54	3	2	5	4	1	5	0	2	2	0	1	1
55	0	2	2	2	1	3	2	1	3	2	0	2
56	1	2	3	6	0	6	3	0	3	0	0	0
57	2	3	5	8	1	9	1	1	2	0	0	0
58	5	2	7	5	1	6	1	0	1	1	0	1
59	3	2	5	7	2	9	3	1	4	0	0	0
60	4	5	9	9	1	10	5	1	6	1	0	1
61	7	3	10	8	4	12	5	1	6	1	1	2
62	2	1	3	16	2	18	4	1	5	1	0	1
63	5	4	9	8	2	11	2	2	4	2	2	4
64	3	7	10	8	3	11	4	1	5	0	3	3
65	6	4	10	11	4	15	1	3	4	2	4	6
66	6	11	17	14	4	18	3	3	6	1	2	3
67	2	17	19	5	5	10	1	0	1	0	2	2
68	5	15	20	15	12	27	3	4	7	2	5	7
69	7	13	20	7	6	13	4	5	9	0	4	4
70	3	15	18	20	6	26	6	4	10	0	2	2
71	6	10	16	15	10	25	7	3	10	1	6	7
72	6	20	26	9	5	14	2	5	7	0	4	4
73	5	17	22	14	11	25	4	3	7	1	3	4
74	5	13	18	10	9	19	1	3	4	0	4	4
75	7	13	20	5	4	9	1	3	4	0	2	2
76	6	15	21	3	8	11	2	2	4	0	1	1

Appendix 2; Table 1 (cont'd)

AREA FORK LENGTH (CM)	SHELTER POINT			WILLOW POINT			BIG ROCK			CAPE MUDGE		
	M	F	T	M	F	T	M	F	T	M	F	T
77	5	13	18	7	2	9	1	0	1	0	0	0
78	5	13	18	5	2	7	0	0	0	0	1	1
79	0	13	13	4	2	6	1	2	3	1	2	3
80	3	18	21	1	3	4	-	3	3	1	0	1
81	4	15	19	2	4	6	-	1	1	0	0	0
82	6	22	28	1	6	7	-	0	0	0	0	0
83	2	19	21	1	4	5	-	2	2	0	1	1
84	1	9	10	1	3	4	-	4	4	0	0	0
85	0	24	24	0	2	2	-	0	0	1	0	1
86	0	10	10	0	3	3	-	2	2	-	0	0
87	0	12	12	1	3	4	-	1	1	-	0	0
88	2	21	23	-	6	6	-	1	1	-	1	1
89	-	25	25	-	1	1	-	1	1	-	1	1
90	-	21	21	-	3	3	-	3	3	-	0	0
91	-	20	20	-	3	3	-	2	2	-	1	1
92	-	11	11	-	1	1	-	0	0	-	2	2
93	-	11	11	-	2	2	-	1	1	-	0	0
94	-	13	13	-	2	2	-	3	3	-	0	0
95	-	11	11	-	5	5	-	3	3	-	0	0
96	-	14	14	-	1	1	-	0	0	-	1	1
97	-	10	10	-	2	2	-	2	2	-	0	0
98	-	3	3	-	1	1	-	0	0	-	1	1
99	-	9	9	-	2	2	-	2	2	-	0	0
100	-	10	10	-	0	0	-	2	2	-	0	0
101	-	3	3	-	2	2	-	1	1	-	0	0
102	-	4	4	-	1	1	-	0	0	-	1	1
103	-	5	5	-	2	2	-	0	0	-	0	0
104	-	0	0	-	0	0	-	0	0	-	1	1
105	-	1	1	-	0	0	-	0	0	-	-	-
106	-	4	4	-	0	0	-	0	0	-	-	-
107	-	0	0	-	0	0	-	1	1	-	-	-
108	-	1	1	-	0	0	-	-	-	-	-	-
109	-	2	2	-	0	0	-	-	-	-	-	-
110	-	0	0	-	0	0	-	-	-	-	-	-
111	-	0	0	-	0	0	-	-	-	-	-	-
112	-	0	0	-	0	0	-	-	-	-	-	-
113	-	0	0	-	1	1	-	-	-	-	-	-
114	-	0	0	-	-	-	-	-	-	-	-	-
115	-	0	0	-	-	-	-	-	-	-	-	-
116	-	0	0	-	-	-	-	-	-	-	-	-
117	-	0	0	-	-	-	-	-	-	-	-	-
118	-	0	0	-	-	-	-	-	-	-	-	-
119	-	0	0	-	-	-	-	-	-	-	-	-
120	-	1	1	-	-	-	-	-	-	-	-	-
TOTAL	130	565	695	246	177	424	71	86	157	21	59	80

Appendix 2; Table 1 (con'd)

AREA FORK LENGTH (CM)	DISCOVERY PASSAGE SOUTH			SEYMOUR NARROWS			DISCOVERY PASSAGE NORTH			STUART ISLAND		
	M	F	T	M	F	T	M	F	T	M	F	T
32	-	-	-	-	-	-	-	-	3	-	-	-
33	-	-	-	-	-	-	-	1	1	-	-	-
34	-	-	-	-	-	-	-	0	0	-	-	-
35	-	-	-	-	1	1	-	0	1	-	-	-
36	-	-	-	1	0	1	-	0	4	-	-	-
37	-	-	-	0	1	1	-	0	2	-	-	-
38	1	-	1	0	2	2	-	0	1	-	-	-
39	0	-	0	0	2	2	-	0	0	-	1	1
40	0	-	0	0	0	0	-	0	2	-	0	0
41	0	-	0	2	1	4	-	0	1	2	1	3
42	1	-	1	2	0	2	-	0	0	1	3	4
43	0	1	1	0	0	0	-	0	0	1	1	2
44	0	0	0	2	0	2	-	0	0	0	2	2
45	0	0	0	3	0	3	1	0	1	0	1	1
46	0	0	0	2	0	2	1	0	1	0	2	2
47	0	0	0	2	0	2	2	0	2	0	0	0
48	0	0	0	5	1	6	1	1	2	0	2	2
49	3	0	3	5	1	6	1	1	2	4	0	4
50	0	0	0	4	0	4	2	0	2	1	0	1
51	2	0	2	7	0	7	1	1	2	2	2	4
52	0	0	0	12	3	15	1	0	1	4	5	9
53	4	1	5	11	0	11	0	0	0	3	6	9
54	3	1	4	7	0	7	1	0	1	2	5	7
55	1	0	1	10	0	10	2	0	2	2	4	6
56	3	0	3	10	2	12	2	0	2	5	2	7
57	3	0	3	8	1	9	2	0	2	10	2	12
58	2	0	2	12	0	12	3	0	3	3	2	5
59	2	0	2	5	0	6	3	2	5	6	3	9
60	1	1	3	8	1	9	1	0	1	8	4	12
61	0	1	1	4	1	5	0	0	0	3	6	9
62	2	1	3	9	2	11	2	1	3	4	2	6
63	1	0	1	12	2	14	1	1	2	3	4	7
64	1	1	2	8	0	8	5	0	5	6	5	11
65	0	0	0	8	3	11	2	0	2	0	4	4
66	0	0	0	7	1	8	1	1	2	4	10	14
67	0	0	0	0	3	3	1	0	1	5	9	14
68	0	0	0	4	0	4	2	1	3	2	9	11
69	0	0	0	2	0	2	0	1	1	1	5	6
70	0	0	0	2	0	2	1	0	1	2	4	6
71	1	1	2	0	0	0	1	1	2	2	1	3
72	0	0	0	0	0	0	0	0	0	1	3	4
73	1	1	3	2	0	2	0	0	0	2	9	11
74	0	1	1	0	1	1	2	0	2	4	4	8
75	0	-	0	0	0	0	-	0	0	3	6	9
76	1	-	1	0	0	0	-	0	0	3	1	4

Appendix 2; Table 1 (cont'd)

AREA FORK LENGTH (CM)	DISCOVERY PASSAGE SOUTH			SEYMOUR NARROWS			DISCOVERY PASSAGE NORTH			STUART ISLAND		
	M	F	T	M	F	T	M	F	T	M	F	T
77	-	-	-	1	0	1	-	0	0	1	3	4
78	-	-	-	-	1	1	-	0	0	1	3	4
79	-	-	-	-	1	1	-	1	1	0	0	0
80	-	-	-	-	0	0	-	0	0	0	4	4
81	-	-	-	-	0	0	-	0	0	0	4	4
82	-	-	-	-	0	0	-	0	0	1	4	5
83	-	-	-	-	0	0	-	0	0	2	4	6
84	-	-	-	-	0	0	-	0	0	0	3	3
85	-	-	-	-	0	0	-	0	0	0	3	3
86	-	-	-	-	0	0	-	0	0	0	1	1
87	-	-	-	-	0	0	-	1	1	0	4	4
88	-	-	-	-	0	0	-	-	-	0	5	5
89	-	-	-	-	1	1	-	-	-	0	0	0
90	-	-	-	-	-	-	-	-	-	0	2	2
91	-	-	-	-	-	-	-	-	-	1	3	4
92	-	-	-	-	-	-	-	-	-	-	1	1
93	-	-	-	-	-	-	-	-	-	-	1	1
94	-	-	-	-	-	-	-	-	-	-	2	2
95	-	-	-	-	-	-	-	-	-	-	2	2
96	-	-	-	-	-	-	-	-	-	-	3	3
97	-	-	-	-	-	-	-	-	-	-	2	2
98	-	-	-	-	-	-	-	-	-	-	1	1
99	-	-	-	-	-	-	-	-	-	-	1	1
100	-	-	-	-	-	-	-	-	-	-	0	0
101	-	-	-	-	-	-	-	-	-	-	0	0
102	-	-	-	-	-	-	-	-	-	-	0	0
103	-	-	-	-	-	-	-	-	-	-	1	1
104	-	-	-	-	-	-	-	-	-	-	0	0
105	-	-	-	-	-	-	-	-	-	-	1	1
106	-	-	-	-	-	-	-	-	-	-	0	0
107	-	-	-	-	-	-	-	-	-	-	0	0
108	-	-	-	-	-	-	-	-	-	-	0	0
109	-	-	-	-	-	-	-	-	-	-	0	0
110	-	-	-	-	-	-	-	-	-	-	1	1
111	-	-	-	-	-	-	-	-	-	-	-	-
112	-	-	-	-	-	-	-	-	-	-	-	-
113	-	-	-	-	-	-	-	-	-	-	-	-
114	-	-	-	-	-	-	-	-	-	-	-	-
115	-	-	-	-	-	-	-	-	-	-	-	-
116	-	-	-	-	-	-	-	-	-	-	-	-
117	-	-	-	-	-	-	-	-	-	-	-	-
118	-	-	-	-	-	-	-	-	-	-	-	-
119	-	-	-	-	-	-	-	-	-	-	-	-
120	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	33	10	45	177	32	211	42	14	70	105	189	294

Appendix 2; Table 1 (cont'd)

AREA FORK LENGTH (CM)	PENDER HARBOUR		
	M	F	T
32	-	-	-
33	-	-	-
34	-	2	2
35	1	0	1
36	0	0	0
37	0	0	0
38	1	1	2
39	1	2	3
40	1	4	5
41	2	1	3
42	4	4	8
43	3	6	9
44	1	3	4
45	2	6	8
46	7	3	10
47	6	2	8
48	11	1	12
49	16	2	18
50	13	5	18
51	9	6	15
52	18	8	26
53	18	7	25
54	21	4	25
55	14	7	21
56	20	7	27
57	14	4	18
58	16	4	20
59	16	4	20
60	5	3	8
61	4	6	10
62	4	4	8
63	6	6	12
64	5	7	12
65	3	3	6
66	4	2	6
67	2	3	5
68	1	2	3
69	5	3	8
70	0	3	3
71	4	5	9
72	3	6	9
73	5	3	8
74	3	2	5
76	1	6	7

AREA FORK LENGTH (CM)	PENDER HARBOUR		
	M	F	T
77	4	4	8
78	4	7	11
79	3	5	8
80	1	3	4
81	0	1	1
82	0	4	4
83	0	6	6
84	0	6	6
85	0	1	2
86	0	3	3
87	1	7	8
88	0	4	4
89	1	3	4
90	-	4	4
91	-	5	5
92	-	5	5
93	-	3	3
94	-	2	2
95	-	2	2
96	-	4	4
97	-	4	4
98	-	2	2
99	-	2	2
100	-	4	4
101	-	0	0
102	-	2	2
103	-	1	1
104	-	2	2
105	-	2	2
106	-	1	1
107	-	-	-
108	-	-	-
109	-	-	-
110	-	-	-
111	-	-	-
112	-	-	-
113	-	-	-
114	-	-	-
115	-	-	-
116	-	-	-
117	-	-	-
118	-	-	-
119	-	-	-
120	-	-	-
TOTAL	291	257	549